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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/932,392	09/17/97	SOUTAR A	A0626/7029/A

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EXAMINER	
TALBOT, B	
ART UNIT	**PAPER NUMBER**
1112	19

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/932,392	Applicant(s) Soutar et al.
	Examiner Brian K. Talbot	Group Art Unit 1112

☒ Responsive to communication(s) filed on *Sep 17, 1997* .

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-18, 20-26, and 34-44* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-18, 20-26, and 34-44* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

1. This application is an FWC of US Ser. No. 08/567,886 filed 12/8/95, now abandoned. Claims 1-18,20-26 and 34-44 remain in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1,3-7,10-16,21-26 and 34-43 are rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553).

Greenberg et al. (3,993,845) teaches novel copper-silver metallic films prepared on transparent articles by chemical replacement of silver for copper. According to the method the transparent article is coated with copper by conventional methods of deposition. The copper article is then contacted by a solution comprising a silver salt, ammonia and a complexing agent which promotes replacement but which does not accelerate the oxidation of residual metallic copper in the film (see abstract). The surface of the substrate to be coated is first cleaned by conventional cleaning procedures (col. 2, line 67 - col. 3, line 2). The complexing agent utilized includes ethylenediamine tetra acetic acid (col. 3, lines 9-14). The concentration of silver nitrate is typically between 0.5 to 5.0 grams (col. 5, lines 29-35) or approximately 1 gram/l (see Examples). The concentration of complexing agent is from 1 to 8 grams/liter and depends upon

the type utilized (col. 5, lines 35-45). The replacement solution is maintained in contact with the film at room temperature, i.e. 23°C, for a period of from less than one minute to five minutes (col. 5, lines 45-50) and can be in the range of 20°C to 90°C (col. 6, lines 62-65). The replacement solution is then rinsed from the article and dried with air (col. 5, lines 53-55).

Greenberg et al. (3,993,845) fails to teach a silver plating solution which is free of ammonia ions or thiosulfate ions.

Mandich et al. (5,322,553) teaches electroless plating compositions which do not contain ammonia, formaldehyde, cyanide, etc. Mandich et al. (5,322,553) teaches that formaldehyde does not make the plating bath stable or commercially useful on a large scale, the use of ammonia either as a stabilizer, a main complexing agent or both is known to be very shock sensitive explosives when dried (col. 1, lines 10-30). The plating solution may also be cyanide-free (col. 1, lines 59-61).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Greenberg et al.'s (3,993,845) silver plating solution by making the plating solution free of ammonia as suggested by Mandich et al. (5,322,553) because one skilled in the art would want to avoid the problems associated with their use as evidenced above.

It is noted that the references fail to teach the claimed pH , however, it is the Examiner's position that it is within the purview of one skilled in the art to obtain the optimal pH range through routine experimentation and that the pH is known to be a "cause effective" variable.

It is noted that claim 13 recites a specific thickness, i.e. 0.5 micrometers. It is the Examiner's position that thickness is a "cause effective" variable and it would have been obvious to one skilled in the art at the time the invention was made to have obtained the optimal thickness through routine experimentation.

Claims 2,17,18 and 44 are rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) further in view of Applicant's admitted state of the art (specification, pg. 1, line 8 - pg. 9, lines 26).

Features described above in rejecting claims 1,3-7,10-16,21-26 and 34-43 over Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) are incorporated here.

Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) fail to teach silver plating metal conductive pads, through holes and combinations thereof with the aid of masks for covering the areas desired to remain free of silver coating.

Applicant's admitted state of the art (specification, pg. 1, line 8 - pg. 9, lines 26) teaches that it is well known to utilize silver coating on copper substrates for protecting the copper from oxidation with the use of masks.

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have utilized Greenberg et al.'s (3,993,845) in view of Mandich et al. (5,322,553) silver replacement process for depositing silver on copper in Applicant's admitted state of the art (specification, pg. 1, line 8 - pg. 9, lines 26) printed circuit board construction because one skilled

in the art would want to obtain the benefits associated with such a process, i.e. less oxidation of the copper surface as evidenced by Greenberg et al. (3,993,845).

Claims 8,9,20 are rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) further in view of Leahy et al. (4,067,784).

Features described above in rejecting claims 1,3-7,10-16,21-26 and 34-43 over Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) are incorporated here.

Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) fail to teach incorporating surfactants, buffers, etc. in the silver plating solution.

Leahy et al. (4,067,784) teaches a non-cyanide acidic silver plating bath which incorporates a buffer and a surfactant. Additionally, the plating solution can contain brighteners and other additives known to those skilled in the art (col. 2, lines 25-65).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Greenberg et al.'s (3,993,845) in view of Mandich et al. (5,322,553) silver plating solution by incorporating additives such as buffers and surfactants because one skilled in the art would want to obtain the benefits associated with their use as evidenced by Leahy et al. (4,067,784).

Response to Amendment

4. Applicant's arguments have been fully considered but they are not deemed to be persuasive.

Applicant argued that Greenberg et al. (3,993,845) fails to teach a displacement process without the use of additional additives such as ammonia or thiosulfate ions.

The Examiner agrees. In response to Applicant's piecemeal analysis of the references, the rejection is not overcome by pointing out that one reference, i.e. Greenberg et al. (3,993,845), does not contain a particular limitation, i.e. a non-ammonia displacement solution, when reliance for that teaching is on another reference, i.e. Mandich et al. (5,322,553). *In Re Lyons* 150 USPQ 741 (CCPA 1966). Moreover, it is well settled that one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references. *In Re Keller*, 208 USPQ 871 (CCPA 1981); *In Re Young*, 159 USPQ 725 (CCPA 1968). While the Examiner acknowledges the fact that Mandich et al.'s silver plating composition includes thiosulfate ions in the form of thiosulfate-sulfite-sulfate, the reference suggest to one skilled in the art not to use ammonia ions (see citation above). The claim requires a composition that is either free of ammonia ions, thiosulfate ions or a combination thereof. Mandich et al. Clearly teaches a composition that is free of ammonia. Hence the claim limitation is met.

Applicant argued that Leahy et al. (4,067,784) teaches a non-cyanide acidic silver electroplating bath which contains thiosulfate ions which is not used in the present invention's plating bath.

While the Examiner acknowledges this fact, the reference is relied upon for teaching that it is conventional in the plating art to utilize additives such as buffers and surfactants and not for the specific plating composition disclosed. Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553) are cited for teaching the "main part" of the plating solution.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (703) 305-3775.

Brian K. Talbot
Patent Examiner
AU 1112

bkt
January 5, 1998